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coincidence. This year is the fiftieth anniversary of the first treaty signed by Commodore Perry with the Empire of Japan. So the birth of your Society is connected with the birth of our modern advancement, and it is most delightful to me to have the opportunity to say a few words on behalf of the Japanese Empire. My country and my people owe everything, all their progress and achievement, to the good offices of the United States. So that with whatever laurels of honour we are crowned they were given by you by the making of that treaty just fifty years ago, when you were founding your Society in this great City of New York. . . .

The President introduced Mr. Henry G. Bryant, President of the Philadelphia Geographical Society, who tendered the congratulations of his Society, and continued:

I believe American geographers fully appreciate the large share borne by this Society in entertaining the members attending the recent Geographic Congress, and I think that if that Congress accomplished nothing else it has brought about a better understanding between the Geographical Societies of this country. I believe that every American who attended that Congress in New York took special pride in showing to our distinguished foreign delegates the noble home of this Society, the like of which I have seen nowhere in America or in Europe, and I feel also sure that those strangers, on returning to their homes, will have a full appreciation of the dignity which our science has attained in this Western World. . . .

There are two men who have probably done more to interest me in geography than any others I have met. Both men were Presidents of this Society. I refer to the late Charles P. Daly and Commander Peary—the one the kindly and lovable gentleman and the enthusiastic student of geography, the other the gallant explorer of the Far North.

THE PRESIDENT: Ladies and Gentlemen, this closes the order of exercises for the evening. We bid you God-speed until the next dinner of the American Geographical Society.

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## THE INVESTIGATION OF ALASKA'S MINERAL WEALTH.\*

BY

ALFRED H. BROOKS.

The developments of the last five years have shown that Alaska, as a field for mining, stands in the first rank among the possessions of the United States. Its annual gold output is now about \$8,000,000. It produces silver, copper, and coal in commercial

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\* Published by permission of the Director, U. S. Geological Survey.

Mr. Brooks, who is the Geologist-in-Charge of "The Division of Alaskan Mineral Resources" in the U. S. Geological Survey, read this paper before the American Institute of Mining Engineers at its Lake Superior meeting in September last. It is reproduced here because it is the authoritative presentation of the facts relating to a subject of large public interest. Mr. Brooks's data cover the subject to the close of 1903. To complete the review, readers are referred to "Notes on Topographic Surveys in Alaska, 1904," in the November BULLETIN, pp. 699-701. The accompanying map is based upon that with which Mr. Brooks illustrated his paper. A complete bibliography of the U. S. Geological Survey publications on Alaska, including maps, is printed in *Bulletin 227* issued by the Survey.—THE EDITOR.

quantities, and its recently-discovered tin and petroleum promise to become important products. Concurrent with the gradual development of this wealth, the mining public has ceased to regard the territory simply as an Arctic province where a few placer-miners struggle with adverse conditions to secure a grub-stake or a modest fortune. Of late years there has been a large influx of capital to investigate its mineral resources, but in its area of nearly 600,000 square miles there still remain large unexploited and little-known fields.

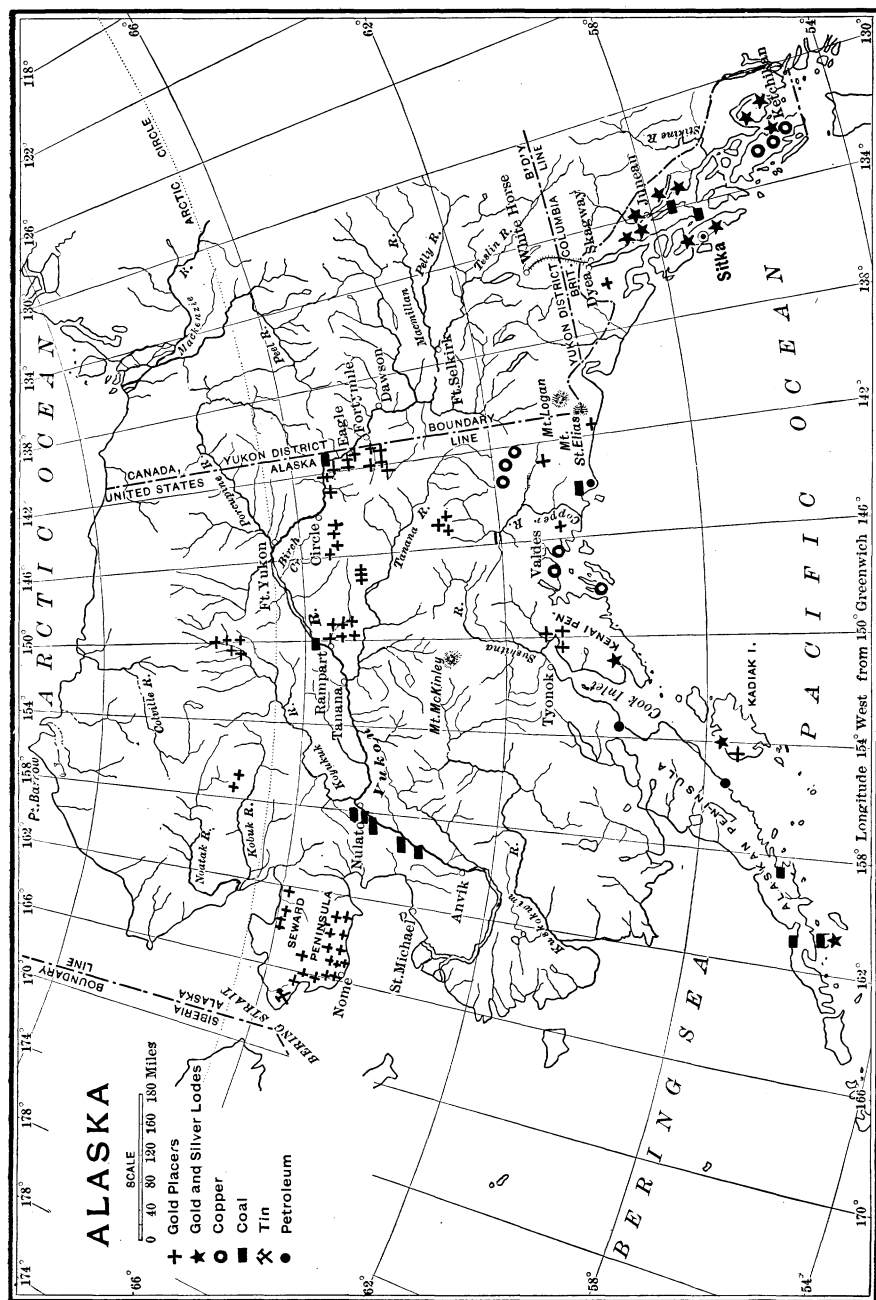
This work of investigation has been carried on under adverse conditions, and reflects credit on all who have shared in it, whether prospectors, mining engineers, or geologists. It is the purpose of this paper to outline briefly what has been and is being accomplished toward furthering the knowledge of Alaska's mineral wealth, and in this connection to present a brief history of the operations of the United States Geological Survey in the Territory. A list of the publications of the Geological Survey which pertain to Alaska will be presented as an appendix, in the hope that it may prove useful to those who are interested in the mining of this northern province.

During the Russian occupation of Alaska, from 1783 to 1866, but little attempt was made to delineate its geographic features or to study its geology and mineral resources. The Russian-American Company, which long held control of the Territory, was entirely absorbed in the exploitation of its fur trade, without concern for its other possibilities. During the last decades of the Russian régime, however, the Fur Company was compelled by Imperial ukase to choose its administrative head from among naval officers, and some of these governors, notably Wrangell and Tebenkof, were men of scientific attainments and interests, under whose administration the finances suffered somewhat, but the cause of exploration was materially advanced by attempts at charting the coastal region, and even by an occasional expedition into the interior. From these surveys, supplemented by the efforts of navigators and explorers of various nationalities—chiefly English—was obtained a fairly complete knowledge of the entire coast-line of Alaska, and some geographic data concerning the lower courses of the Yukon, Kuskokwim, and Copper Rivers. Many of the expeditions included naturalists who made geologic observations and palæontologic collections, which eventually found their way to various scientific institutions of Europe; but, at best, the results were merely fragmentary. It was the policy of the Russian-American Company to

discourage the development of any mining interests within the territory, out of a belief that mining would be inimical to the fur-trading interest. When, however, the administration of the naval governors combined with the decrease of the fur-bearing animals to bring about a diminution of revenues, an abortive search was made for mineral wealth. A mining engineer by the name of Doroshin was dispatched to Sitka in 1848, and spent the succeeding two years in examining the islands thereabouts and in the Cook Inlet region; and he did, in fact, make the first discovery of gold in Alaska. But as the returns from nearly a year's work of some 40 men yielded only a few ounces of placer-gold, obtained near Cook Inlet, he reported adversely as to the presence of gold in commercial quantities, thus terminating the only Russian attempt at gold-mining in Alaska. The current reports of evidences of Russian placer operations in various mining districts have so far proved to be without foundation.

Doroshin did, however, recommend the mining of coal at Cook Inlet, and the demand created by the gold discoveries in California led to the establishment of such an enterprise on Port Graham, in 1852, but without commercial success. The Russians made no other attempt at developing mineral resources, unless the shipment of ice to California, carried on in a desultory manner for some years, can be regarded as such.

The Russian traders had pushed their way a thousand miles up the Yukon, and had explored the lower stretches of the Kuskokwim and Copper Rivers; but previous to 1865 little was known of the interior of what was then called Russian America. In that year it was reported at Sitka that American prospectors had found gold on the Stikine River, and an expedition was dispatched to verify the rumour and establish the International Boundary. With the party went Professor W. P. Blake as geologist, among the first of Americans to investigate the geology of Alaska. From the east the interior had been penetrated by the traders of the Hudson Bay Company, who, following the routes marked out by such explorers as Franklin and Mackenzie, had reached the Yukon in 1849; but they, too, were adverse to the development of mining industries, and made no attempt to investigate mineral resources. In 1865 the Western Union Telegraph Company organized a survey of northwestern America to find a route through Canada to Bering Strait, in order to connect by cable with a line crossing Siberia from Europe. The success of the Atlantic cable led to the abandonment of the project, but the investigations of the scientists and



MAP SHOWING MINERAL DEPOSITS IN ALASKA.

explorers of the expedition were of lasting importance; though, except for the work of Dr. Wm. H. Dall, the most prominent member of the parties, they were of solely geographic interest. Dall continued his work in Alaska as a member of the Coast Survey after the transfer of the territory.

In 1866 Russia ceded her North American possessions to the United States for the sum of \$7,200,000, and Russian America became Alaska. The interest awakened by the addition of this vast domain was only short-lived among the mass of the American people, the majority of whom regarded it as an Arctic province possessing no value outside of the fur trade. Few, if any, dreamed that this isolated possession was destined to become a great mineral producer, and that in the course of one generation its annual gold output would exceed by over a million dollars the price paid for the entire territory.

The apathy of the public and the neglect of the executive and legislative arms of the Government relegated the new possession to temporary oblivion. For twenty years after Alaska passed under the control of the United States systematic surveys were limited to its coast-line. Explorations in the interior were fostered by the various branches of the Government and by private enterprise, but only intermittently and without definite purpose. Thus, while there developed gradually a somewhat more exact geographic knowledge of our new Territory, no light was thrown on its mineral resources. But while the Government's interest in this virgin field lay dormant it soon attracted the ever-active American prospector. As already noted, he found gold on the Stikine even before the purchase of Alaska. Following this came the discovery of auriferous quartz near Sitka in 1879, and of gold in the Juneau placers in 1880. It was the development of the latter which led to the finding of the gold-bearing lodes that have made Juneau the foremost mining-camp of Alaska. The restless pioneers, soon finding means to overcome the opposition of the natives to the white men's penetrating the interior, made their way across the Chilkoot Pass, and while descending the Lewes River came upon more gold. In 1886 the gold-placers of the Fortymile region were discovered, and the discovery of other districts followed rapidly during the succeeding decade.

These Yukon pioneer miners were dependent entirely upon their own resources, formulated and executed their own laws, and were practically ignored by the Territorial and Federal Governments. It is largely to their perseverance and pluck that the country now owes

its millions of revenues from the Alaskan placer-fields. Not until 1895 did Congress awake to the importance of examining into Alaska's mineral wealth. In that year \$5,000 was appropriated for an investigation of its coal and gold resources by the U. S. Geological Survey; and, small as the sum was—considering that the territory to be investigated was two and one-half times the size of Texas, and that the field of investigation lay two or three weeks' journey from Pacific Coast ports—this was the first organized attempt in this direction.

The party which was sent out spent the summer of 1895 in an extensive examination of the Pacific coastal belt, and accumulated valuable information regarding the distribution of the coal-bearing rocks and the character of the gold deposits.

In the following year a similar appropriation was made, and a party of three was sent inland to study the placer-districts along the Yukon River. This long journey, at a time when few had penetrated to the Yukon gold fields, was accomplished at the expense of considerable hardship, the party succeeding in visiting all of the producing gold-camps of the Yukon, among which were numbered at that time Fortymile, Birch Creek, and Minook districts. The investigation could not be continued in 1897, because the Appropriation Bill failed to pass in time to make the funds available in this distant province. It was the discovery of the Klondike gold-placers in 1896 that opened people's eyes to Alaska's importance, and, as the facts became disseminated during the following two years, public opinion on this point rapidly changed. There was then pressing demand for reliable information about the northwestern part of the continent. This was met on the part of Congress in 1898 by appropriations for various bureaux for Alaskan investigations to be made by the Government; and the amount to be expended by the U. S. Geological Survey for this purpose was increased to \$20,000. Under this latter appropriation the U. S. Geological Survey began the series of systematic surveys in Alaska which it has continued to the present time.

The task before it was not an easy one. Here was an area of from 500,000 to 600,000 square miles, of which little but the coast had been surveyed and very large areas were almost unexplored. The province to be investigated was far distant, and the season of operations limited to the summer months. Moreover, the work must be so conducted that the results should be available at the earliest possible date. No plans which required more than one season for their execution could be considered, for there was an

urgent demand on the part of the thousands who were working blindly in this northern region for immediate information. It is plain that these conditions could not be met by planning detailed and final surveys, which, while of the utmost importance to a mining community, must be preceded by explorations and reconnaissances. Moreover, the fact that the work had to be begun within a month from the time the Appropriation Bill passed left little time to formulate plans and organize parties. Fortunately, the U. S. Geological Survey was able to draw on a corps of geologists and topographers who had been trained in other fields for work of this character.

It was decided to send four parties to Alaska—one to map an area lying close to the new Klondike placer-fields, and the others to conduct extensive explorations. One of the latter made a reconnaissance of the Sushitna River valley and crossed the divide to the Cantwell, mapping the topography and geology as far as the means would permit and determining the position and altitude of Mount McKinley. Something was learned regarding the distribution of the placers in the Sushitna valley, and the source of the gold was traced to small quartz-seams in metamorphic slates.

Another expedition ascended the Skwentna from Cook Inlet, portaged along the Alaskan range to the headwaters of the Kuskokwim, and, following this great river to the sea, then turned eastward, and, partly along the coast and partly inland, made its way back to the Pacific Coast, completing in four months a journey of more than 1,400 miles.

The other party, which was distinctly topographic, made its way inland along the same route and mapped some 2,000 square miles lying chiefly in the placer district of the Fortymile region.

On its way inland, the third party followed the then much-travelled Klondike route as far as the mouth of the White River, ascended that for about 100 miles, then crossed to the waters of the Tanana by portage, and followed that river to its mouth. The report of the topographic and geologic results of this expedition contained suggestions in regard to the distribution of placer-gold which have been verified by the recent discoveries in that field.

In that same year the U. S. Geological Survey was enabled, by the courtesy of the War Department, to assign two of its geologists to accompany army expeditions into the interior of Alaska. The one conducted explorations in the Copper River basin, while the other made its way inland from Cook Inlet.

At the close of the season of 1898 the reports of these different



reconnaissances and exploring expeditions not only increased the geographic knowledge of Alaska, but contained much practical information in regard to routes, trails, and timber, as well as to the geology and mineral resources.

In 1899 the investigation was continued by two expeditions—one across the country from Pyramid Harbour on Lynn Canal to Eagle City on the Yukon; and the other from the Yukon north to the Koyukuk. The first made its way along the northern front of the Saint Elias range, across the headwaters of the White to the Tanana, and, thence turning northward, reached the Yukon by a route through the Fortymile placer-district. On the way a hasty examination was made of the Porcupine placer-district and Forty-mile region. What was still more important, it was definitely established that copper occurred in placers at the headwaters of the White and Tanana Rivers; and the metal was traced to its bed-rock source.

The second party ascended the Chandler, a northerly tributary of the Yukon, and, reaching the basin of the Koyukuk by portage, followed that river to its mouth, giving special attention to the little-known placer-fields of the region.

The accompanying map gives the distribution of the mineral products of Alaska as far as is known at present.

Towards the close of the season of 1899, the two parties combined and utilized the few remaining weeks in visiting the newly-discovered gold deposits of Nome, thus gaining material to publish a preliminary report on this important placer-field in the following winter. The wide circulation of this report instances the value of early publication of results.

The increase in gold output of the Seward Peninsula, from \$15,000 in 1898 to more than \$2,000,000 in 1899, excited an interest which rivalled that shown in the Klondike. From the 20,000 people who went north during the summer of 1900 there arose an urgent demand for topographic surveys and information in regard to the mineral resources of the district. To meet these new developments, the purely exploratory work of the Survey was set aside for the time being, while activities were directed to a real mapping of the newly-discovered fields. About half of the Alaskan forces were concentrated in the Seward Peninsula. These in the course of one season not only completed a contoured map of an area covering more than 6,000 square miles, but made a personal investigation of every placer-district and practically every creek of the southern half of the peninsula; as a result of which a report was issued the

following year, showing the distribution of the gold-bearing gravels, the source of gold and its mode of occurrence. The question of bonanzas in the placers was the subject of special discussion. The theories advanced as to their probable origin have, in most cases, been confirmed by later developments in the region.

The discoveries in this season of workable placers in the high bench, tundra and elevated beach-gravels of the Seward Peninsula furnished further proof of the value of geologic work; for the report of the previous year, in calling attention to these gravel-deposits, then entirely unprospected, had dwelt upon the probability of their being auriferous. A similar instance was the discovery by a member of the Survey of stream-tin in the York region.

In the Copper River region there had been seemingly important discoveries of copper, and an urgent demand came from capitalists, mine owners, and engineers for more authentic data. To meet this demand a large force was dispatched to the new district and an area of some 5,000 square miles was mapped topographically on a scale of 4 miles to the inch. Within this belt a geologic reconnaissance map was made, and the general occurrence of the copper-bearing rocks was determined, while individual prospects were examined as far as possible. The report which resulted from this work was of such a character that mining engineers had definite basis for making preliminary estimates on the cost of railroad construction, as well as considerable data on the probable extension and value of the copper-deposits. The same season a more hasty examination was made of the copper-deposits of Prince William Sound.

In 1901 the work in the Seward Peninsula was extended to the northward by a reconnaissance survey of about 5,000 square miles. Some additional information was obtained regarding the distribution of stream-tin, and considerable areas were examined in sufficient detail to enable a fairly definite statement to be made regarding the presence and absence of placer-gold. A most valuable feature of the work, in the light of after-developments, was the outline of some granite intrusives, for it is along the contact of the sediments and granites that tin-deposits have been discovered.

The same year witnessed very important explorations in northern Alaska. One party, which had to travel 1,200 miles by dog-teams in mid-winter, made a reconnaissance survey from the Yukon northward to the Arctic Ocean, traversing a mountain range which, up to that time, had never been visited by white men, and at the close of the season contrived a hasty examination of the Cape Lis-

burne coal fields. Another survey, carried from the Yukon to Kotzebue Sound, has proved of particular value to the prospector since the discovery of placer-gold within the area surveyed.

During this season the Ketchikan mining district of southeastern Alaska also was subjected to a preliminary examination. Nearly 200 prospects were visited and reported upon, and a geologic reconnaissance map was made of an area covering about 2,000 square miles.

To meet the growing demand for information in regard to the Copper River basin, two parties were sent into this district in 1902. These, besides completing the reconnaissance topographic and geologic mapping of the basin, extended the work both to the north and south. A detailed study was made of the Chistochina gold fields, as well as of the northern copper field, which had received a preliminary examination in 1869.

The growing importance of the Yukon placer-fields and the consequent traffic on the Yukon River had led to a number of only partially successful attempts to mine coal for local use in that field. With the idea of furthering these interests, a party was dispatched to make a special study of the coal. The results showed that there were large areas of coal-bearing rocks on the Yukon, and that while the upper river coals were, for the most part, of lignitic character, some of those along the lower river, which are of a lower geologic horizon, can be graded as semi-bituminous, and should afford a local fuel supply.

Hand in hand with these special geologic investigations, geographic mapping has proceeded by a series of reconnaissance surveys. In 1902 an exploring party made its way from the head of Cook Inlet through the Alaskan range, along its northwestern base to the Tanana River, and thence to the Yukon, completing an 800-mile journey in three months and a half. Yet topographic surveys were maintained throughout, and much was learned of the geology, as well as of the mineral resources. An area of coal outlined on one of the southern forks of the Tanana, though of no immediate importance, has possible future value, for it lies near the route of a proposed railway from Cook Inlet to the Yukon.

The demand in southeastern Alaska, where large capital has been invested in mining-plants, is for detailed geologic and topographic maps. But the great cost of such surveys unfortunately prohibits their extension with the rapidity required by the mining developments. The beginning was made in 1902 by mapping an area of about 80 square miles in the vicinity of Juneau on a scale of one mile to the inch.

With improved transportation facilities, and better organization of the work, came a material decrease in cost, which enabled the U. S. Geological Survey to send seven parties in 1903. To one of these was assigned the task of completing the reconnaissance mapping of the Seward Peninsula, of which there are fairly accurate maps. At the same time an examination of the newly-discovered placer-fields in the northeastern part of the peninsula was made.

The general policy of the Survey is to keep in touch, as far as the appropriations will allow, with all mining interests, and to publish from time to time supplementary reports based upon new data thus obtained. Thus, when the rapid developments in the older-districts of the Seward Peninsula created a demand for further geologic investigation, a party was sent to make a tour of nearly all the important mining-camps in the region. An interesting result of this work was the tracing of the tin to its bed-rock source. Though it is too soon to predict commercial importance for this new discovery, yet all indications are sufficiently favourable to stamp this as an excellent example of the importance of scientific investigation in a new mining district and a most striking case of the practical value of geologic work.

While every effort has been made to keep abreast with conditions in the more important mining-camps in Alaska, at the same time the lesser ones have not been neglected. The Yukon placer-fields have been steadily developing, though at a much slower pace than those in the Seward Peninsula. To meet the great demand for accurate maps and information, two parties were sent into the Yukon country in 1903—one for a topographic survey extending from Eagle City to the Fairbanks district and thence northward to Circle City, and the other to subject the placer-fields of the Forty-mile and Birch Creek regions to a re-examination, and also make some preliminary studies in the newly-discovered Fairbanks district.

The work of the previous year had thrown some light upon the occurrence of the coal on the Yukon, but important stratigraphic problems still remained to be solved, which, while they had no immediate economic value, were still of sufficient practical importance to deserve a share in an investigation of the mineral resources. With this in view another party was sent down the Yukon in 1903, which obtained still more evidence in regard to the age and distribution of the coal.

Mention has been made of the detailed topographic survey of

the region lying adjacent to Juneau. This district came in for geologic investigation in 1903, and the reconnaissance mapping was continued over an additional area extending from Port Houghton to the Porcupine gold-district. The former received a detailed examination, and by careful study of its important mines the relations of the ore-bodies were determined and important conclusions reached in regard to their distribution.

While the interest in Alaska centres chiefly in its placer-mines, yet during the past three years considerable prospecting for petroleum has gone on. The successful boring of a well in the Controller Bay region and the favourable indications in the Alaska Peninsula led the U. S. Geological Survey to dispatch a party in 1903 to make a preliminary examination. Reconnaissance surveys in the Controller Bay region and in the oil fields of Enochkin and Cold Bays on the Alaska Peninsula yielded much data as to the geologic conditions of the petroleum distribution. While these studies were only preliminary and cannot be considered conclusive, they at least show that these districts give promise of producing oil and that drilling wells can be considered a legitimate operation. Furthermore, it was definitely ascertained that there are workable coal-seams of a semi-anthracitic character in the neighbourhood of Controller Bay. As this coal is of the highest grade yet found on the Pacific Coast, it promises, in spite of the somewhat adverse conditions for shipping, to become an important resource of the Territory.

In the foregoing an attempt has been made to outline briefly the character of the work which has been performed for the investigation of Alaska's mineral resources. While it is believed that the results are of practical value—a view which is borne out by the strong support that the U. S. Geological Survey has received from the mining men of Alaska—yet it is only too evident that much remains to be done, and that all of the investigations so far are only preliminary. It will be many years before exhaustive studies can be made, such as are now being carried on in many of the mining districts of the United States.

In July, 1903, the Alaskan surveys, which had been at first a subordinate function of the geologic and topographic branches of the U. S. Geological Survey, were organized as a distinct division, entitled "The Division of Alaskan Mineral Resources," and its administration was vested in a Geologist-in-Charge. The force of workers, which in 1899 numbered only two geologists and two topographers, now includes ten geologists with two assistants and

three topographers with three assistants, besides an additional field force of some thirty men.

It is difficult at the present day to conceive how little was known of Alaska previous to 1898. The expeditions of earlier years had contributed something to the knowledge of the country drained by the Yukon, and more or less indefinite information was available in regard to a few other parts of Alaska, but the country as a whole was practically unknown. Many of the most important geographic features have been added to the map by the reconnaissance and exploration surveys of the years from 1898 to 1903, during which the principal mountain ranges have been outlined and the drainage areas defined.

A most important function of the Alaskan surveys has been the production of contoured maps, the value of which cannot be overestimated. There are demands for them from prospectors, engineers, and capitalists, who find in them an essential aid toward the development of the country along any line. They indicate routes of travel to the prospector and explorer, railway and wagon routes to the locating engineer, and possible sources of water supply to the mine operator. During the six years that systematic work has been carried on an area of between 90,000 and 100,000 square miles has been covered, representing about one-sixth of the total area of Alaska.

While the aim of the work has been to investigate mineral resources, this has, of course, necessitated geologic studies, for it is only through the medium of a thorough geologic knowledge that the facts gathered in regard to the value and distribution of ore-deposits can be practically and scientifically interpreted. From year to year this fundamental knowledge is growing, and in the course of time the geologic history of the Territory will be deciphered. In fact, much is already known of the general succession and distribution of the many bed-rock formations.

The studies of the bed-rock geology contributed by each expedition are resulting in an accumulation of material which becomes increasingly valuable in tracing the distribution and origin of deposits having economic importance. The occurrence of such deposits is but a minor feature of the general geology, but the most important factor in the development of the country. The Survey's function is to study the relation of the two, and, in the course of the studies, results have often been achieved of immediate practical importance to the people of Alaska.

In the preceding paragraphs of this paper reference has been made to the various classes of economic investigations which have been carried on in Alaska. This work is but fairly begun, for nearly all of the examinations have been of a most hasty and preliminary character. It has been the aim to establish general relations, and to give the mining public the benefit of these by early publication of reports, leaving detailed studies to future years, when developments will prove such as to warrant their cost. By pursuing this policy the Survey in the course of the past six years has been able to obtain some information from every mining-camp in Alaska, and this has, for the most part, been promptly published and widely disseminated. Recently Congress has manifested its interest in Alaskan mining affairs by increasing the appropriation for investigation of the mineral resources to \$80,000. This sum will make it possible to push the work at a pace more commensurate with its importance. The Survey's aim will be to keep abreast, if not in advance, of mining developments.

The large investments made in water-supply ditches, pumping plants, and mining machinery in the Seward Peninsula have shown the need of detailed surveys in this field. Though mine operators have many times been witnesses to the value of the present reconnaissance map, the magnitude of the mining operations now necessitates a demand for detailed maps\*. Surveys for this will cost from five to ten times as much as the preliminary ones, but when completed will give the mine operator a thoroughly reliable basis for his engineering work. While this will constitute the only immediate value of the contour maps, yet they will prove of no less importance as a base for detailed geologic studies. These latter will not only determine the distribution of placer-gold, but will throw light on the much-mooted question as to the presence or absence of commercially valuable auriferous veins. There is a like demand for surveys in the Yukon placer-field, but, here, developments have not yet advanced so far as to outstrip the usefulness of reconnaissance maps. These should, however, be pushed to early completion; after which should follow detailed mapping of areas containing placers which prove to be of high commercial value.

In the Cook Inlet placers the surveyor may see another field which demands attention. It has been the scene of such mining activity as to warrant topographic and geologic surveys, but be-

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\* This demand was partly met by the Surveys of 1904. See BULL. A. G. S., p. 700, Nov., 1904.

cause of the urgency of other work it has, up to the present time, been almost neglected.

Because of the great cost involved, the progress of detailed surveys in southeastern Alaska must of necessity be rather slow; but it will be possible within the course of a few seasons to complete the reconnaissance mapping. This, in conjunction with a preliminary study of the occurrence and association of the ore-bearing horizons, should yield results of value to the prospectors.

The heavy capital which is being invested in the oil fields on the Pacific coast of Alaska singles this out also as a region needing further attention. Hand in hand can go a study of the coal fields of this district, which give promise of large commercial importance.

The above suggestions do not by any means exhaust the possibilities for effective geologic and topographic work, but will indicate the lines along which there is the most pressing demand.

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## GEOGRAPHICAL RECORD.

### AMERICAN GEOGRAPHICAL SOCIETY.

TRANSACTIONS OF THE SOCIETY, NOVEMBER–DECEMBER, 1904.—A Regular Meeting of the Society was held at Mendelssohn Hall, No. 119 West Fortieth Street, on Tuesday, November 22, 1904, at 8.30 o'clock P.M.

President Peary in the chair.

The following persons, recommended by the Council, were elected Fellows:

P. J. Goodhart.	Otto Quelle.
George A. Plimpton.	F. W. Bruggerhof.
Mrs. Roswell D. Hitchcock.	Basil H. Soulsby.
Grant Squires.	Andrew Carnegie.
Frank Benedict Cleland.	William L. Brown.
Mort J. Kaufman.	Ernest W. Bowditch.
John D. W. Sterry.	Daniel Moreau Barringer.
John F. Doyle.	Gen. Francis Fessenden.
Sidney Bradford.	Alfred G. Hoe.
H. C. Chatfield-Taylor.	C. Heurich.
George S. Brewster.	Durbin Horne.
Francis J. Arend.	William Gammell.
George Coe Graves.	Bernard G. Gunther.
Samuel M. Bain.	Charles J. Glidden.
William T. Gade.	C. F. Adae.
Robert Garrett.	Anthony Dey.
Carl A. Hansman.	Charles W. Iden.
A. G. Baker.	